Published in final edited form as:

J Behav Med. 2017 October ; 40(5): 814–820. doi:10.1007/s10865-017-9849-8.

High trait shame undermines the protective effects of prevalence knowledge on state shame following HPV/CIN diagnosis in women

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Abstract

Human papillomavirus (HPV), and the related, cervical intraepithelial neoplasia (CIN), are common yet poorly understood physical conditions. The diagnosis of HPV often elicits shame and guilt, which in turn may undermine psychological and physical health. The current study compared shame and guilt responses to diagnosis among two groups: women diagnosed with HPV/CIN and women diagnosed with Epstein–Barr Virus (EBV/IM). Eighty women recently diagnosed with HPV/CIN or EBV/IM completed measures of shame- and guilt-proneness, shame and guilt following diagnosis, and disease knowledge including prevalence estimates (HPV and EBV, respectively). HPV/CIN (vs. EBV/IM) predicted more diagnosis-related shame and guilt. Estimates of high prevalence interacted with diagnosis and shame-proneness to predict diagnosis-related shame. Simple slope analyses indicated that in women with HPV/CIN reporting low-to-average shame-proneness, high prevalence estimates reduced diagnosis-related shame; however, women high in shame-proneness experienced high diagnosis-related shame regardless of more accurate prevalence estimates. Women high in shame-proneness appear to be particularly vulnerable to HPV-related shame even when they are aware that it is very common.

Keywords

Human papillomavirus; Epstein–Barr Virus; Shame; Guilt; Knowledge

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Compliance with ethical standards

Conflict of interest Sarah McQueary Flynn, Tory A. Eisenlohr-Moul, Suzanne C. Segerstrom, Christen T. Logue, and Jamie L. Studts declare that they do not have any conflict of interest.

Human and animal rights and Informed consent All procedures followed were in accordance with ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. Informed consent was obtained from all patients for being included in the study.

Introduction

Human papillomavirus (HPV), a sexually transmitted virus associated with cervical cancer (Bosch & Muñoz, 2002), remains common despite recent vaccine development (Daley et al., 2010). In fact, the Centers for Disease Control and Prevention (CDC) has recently reported that HPV is so ubiquitous that nearly 100% of sexually active men and women will contract it in their lifetime (CDC, 2017). A systematic review found that university students had particularly high prevalence rates of approximately 20–40% (Revzina & DiClemente, 2005); other data show that rates are approximately 45% for women ages 20–24 in the general population, with prevalence increasing with each year of age until age 59 (Dunne et al., 2007).

The HPV virus is usually suppressed by the immune system, preventing the development of cervical intraepithelial neoplasia (CIN) or cervical cancer (Bollen et al., 1999). When the immune system is not able to clear the infection, routine screenings and outpatient treatments reduce cancer risk to negligible levels. Despite the high prevalence and manageability of HPV, diagnosis is often accompanied by significant emotional disruption, with a majority of individuals, particularly women, reporting feelings of shame (Daley et al., 2010, 2015; Maissi et al., 2004). Not only do individuals with HPV experience shame after learning about their diagnosis—they continue to feel shame for months to years afterward (Clarke et al., 1996).

Diagnosis with HPV may cause shame because it represents a social threat; the diagnosis may threaten feelings of social acceptance by evoking expectations of judgment by friends or family for having a sexually-transmitted infection or by evoking expectations of potential rejection by current or future sexual or romantic partners. Such social threats are robustly linked to negative self-evaluative emotions such as shame, a broad, negative appraisal of the self as bad or tarnished, as well as guilt, a negative evaluation of one’s behavior in a specific situation (Tangney et al., 2007; Taylor, 1985). In contrast to diagnosis with HPV, diagnosis with Epstein–Barr Virus (EBV/IM), a similarly common, communicable, and persistent virus, is not associated with significant social threat, stigma, or associated feelings of shame (Straus et al., 1993).

Unfortunately, diagnosis-related shame may contribute to poorer psychological and physical health outcomes in women with HPV, including risk for psychological disorders like anxiety and depression (Dost & Yagmurlu, 2008; Kahn et al., 2007; Maissi et al., 2004; Orth et al., 2006), poorer compliance with subsequent screening for cervical cancer (Miller et al., 1996), and even disruption of the neuroendocrine and immune parameters involved in controlling the infection (Dickerson et al., 2004; Gruenewald et al., 2004; Segerstrom et al., 1996). Because diagnosis-related experiences of social threat and shame may be detrimental to mental and physical well-being, more work is needed to understand the contextual and personality factors that predict experiences of shame following an HPV diagnosis. Such work could facilitate the provision of additional support and ultimately better psychological and physical health outcomes in women diagnosed with HPV.

It is possible that individual differences in the experience of social threat and shame following HPV diagnosis are influenced by both contextual and personality variables; two such variables will be investigated in the present study. First, given the extremely high prevalence rates, accurate prevalence estimates may be expected to reduce feelings of shame. Women who are aware of the high prevalence of HPV may be less likely to interpret their diagnosis as reflecting negatively on the self. Despite high rates of HPV, knowledge of HPV prevalence, transmission, prevention, and etiology seems to be relatively low in the general population (Baer et al., 2000; Kahn et al., 2007; Maissi et al., 2004; Tiro et al., 2007), even after significant increases in HPV education associated with the release of the HPV vaccine (Daley et al., 2010). Specifically, a large percentage of women still do not know that HPV is extremely common or that HPV rarely leads to cancer with routine outpatient treatment (Aerssens et al., 2008; O'Connor et al., 2014). Therefore, mistaken beliefs about low prevalence, which may lead one to fear social rejection on the basis of a sexually-transmitted, stigmatized diagnosis, may be one contextual factor driving experiences of shame following diagnosis (Daley et al., 2010; Kahn et al., 2007; Maissi et al., 2004).

Second, personality may also play a role in predicting shame responses to diagnosis. Higher levels of trait shame-proneness have been found to increase the intensity and chronicity of negative emotional and physiological responses to social threats, and may therefore predict greater experiences of shame associated with HPV diagnosis regardless of prevalence beliefs (Dickerson et al., 2004, 2008; Gruenewald et al., 2004). Further, it is also possible that shame-proneness and inaccurate beliefs that prevalence is low interact to predict shame responses to diagnosis. Because higher baseline feelings of social threat among some individuals (i.e., shame-proneness, loneliness) are associated with poorer cognitive functioning in socially stressful situations (Cacioppo & Hawkley, 2009) individuals with high shame-proneness may be less able to use knowledge about high HPV prevalence to buffer against diagnosis-related shame. Despite preliminary evidence suggesting that these contextual and personality factors might play a role in HPV-related shame, no studies have examined their interactive impact.

Therefore, the primary aim of the current study is to examine the interactive effects of shame-proneness and low prevalence estimates (i.e., a lack of awareness that HPV is common) on diagnosis-related shame and guilt in female college students recently diagnosed with either HPV related cervical intraepithelial neoplasia (HPV/CIN) or infectious mononucleosis (IM; caused by exposure to the Epstein–Barr Virus or EBV/IM). EBV/IM is a comparable infection in regards to prevalence and immunosuppression, yet there is much less social stigma associated with EBV/IM diagnosis than is associated with HPV/CIN making it an ideal comparison group.

Hypotheses

Hypothesis 1—The primary prediction was that women with HPV/CIN will experience significantly more post-diagnosis feelings of state shame and guilt than women diagnosed with EBV/IM, but that trait levels of guilt- and shame-proneness will not differ between diagnoses.

Hypothesis 2—It was predicted that higher diagnostic prevalence estimates (of HPV/CIN or EBV/IM, depending on the group) would be associated with lower state shame in HPV/CIN patients but that no such relationship would exist in EBV/IM patients. That is, individuals with HPV/CIN (vs. EBV/IM) who believe their diagnosis is more common will have lower shame. Further, we hypothesized a two-way interaction between trait shame-proneness and prevalence estimates predicting state shame such that only individuals low in trait shame-proneness will be buffered against shame by believing that their disease is more prevalent, whereas individuals with high trait shame-proneness will exhibit high shame regardless of prevalence estimates.

Methods

Participants and Procedure

Eighty female college students (ages 18–28), 40 of whom were recently diagnosed with an abnormal pap smear (i.e., cytology result) indicating HPV/CIN (test group) and 40 female students in the same age range recently diagnosed with EBV/IM (comparison group), were recruited to participate in a cross-sectional study via informational flyer (i.e., self-nomination) following appointments at a university health service clinic at a large southeastern university or surrounding OB/GYN clinics. Participants were diagnosed with HPV/CIN on the basis of abnormal cytology result. Individuals diagnosed with EBV/IM were diagnosed on the basis of EBV antibodies on a blood test indicating recent infection. Participation took place between initial diagnosis and any follow-appointments (e.g., colposcopy). Participants completed measures of shame, guilt, depression and distress in a private room. In addition to those measures, participants completed a knowledge questionnaire specific to their diagnosis which included an item that asked them to provide an estimate of diagnosis prevalence. All participants received treatment as usual in the context of the university health service or surrounding clinics prior to and following participation. Power calculations based on previous work indicated that this number of participants led to greater than 80% power to detect the medium-sized predicted effects. The protocol was approved by the local institutional review board.

Measures

Demographic characteristics—Demographics were measured with questions inquiring about age, race, income, and relationship status.

Trait guilt and shame-proneness—The Guilt and Shame Proneness Scale (GASP) is a 20 item measure with two subscales measuring guilt-proneness as negative behavior-evaluations (present sample α = .54) and approach responses following private behaviors (present sample α = .83) and two subscales measuring shame-proneness as negative self-evaluations (present sample α = .69) and avoidance responses following public behaviors (present sample α = .78). Guilt subscales were collapsed to yield a total guilt-proneness score, raising the reliability estimate to an acceptable level (present sample α = .81), (M = 5.31, SD = 1.03) (Cohen et al., 2011). Examples of items from the GASP include, “You secretly commit a felony. What is the likelihood that you would feel remorse about breaking the law?” and “You take office supplies home for personal use and you are caught by your

boss. What is the likelihood that you would replace what you broke?" Each item is measured on a scale of 1 (*very unlikely)* to 7 (*very likely*).

State (diagnosis-related) shame and guilt—The shame and guilt subscales of the State Shame and Guilt Scale (SGSS) were also included (Gruenewald et al., 2004). This measure was developed to assess state emotions and does not rely on respondent's ability to distinguish between the words 'shame' and 'guilt.' Items that measure shame include a component of the global self such as: "I feel worthless, powerless." Guilt items include a behavioral component such as: "I feel bad about something that I have done." Each item is measured on a scale from 1 (*not feeling this way at all*) to 5 (*feeling this way very strongly*). Participants were instructed to rate their feelings in response to their recent diagnosis of HPV/CIN or EBV/IM.

Prevalence estimates—Participants were asked, "Approximately what percentage of individuals will contract (HPV or EBV/IM) in their lifetime?" and instructed to write a percentage in the blank. Participants were not given information about true prevalence estimates in the population. Estimated prevalence rates were nearly identical for both HPV (M = 59.62%, SD = 18.54%) and EBV/IM (M = 59.21%, SD = 18.77%).

Statistical Analyses

All analyses were carried out using SPSS Statistics. To test Hypothesis 1, we used independent t-tests to compare outcomes (state shame and guilt, trait shame and guilt) between the two diagnostic groups. To test Hypothesis 2, we utilized a hierarchical linear regression model predicting state shame from the following predictors: (1) sample-standardized trait shame proneness (SP), dichotomous diagnostic group (where EBV = 0 and HPV = 1), and sample-standardized prevalence estimate for one's diagnosis, (2) the interactions of SP × group, SP × prevalence estimate, and group × prevalence estimate, and (3) the three way interaction of SP × group × prevalence estimate. Significant three-way interactions were probed by testing the two-way interaction of SP × prevalence estimate in each diagnostic group. Significant two-way interactions within each diagnostic group were further probed by testing the simple slope of prevalence estimate on the outcome at one SD above and below the sample mean of trait shame-proneness.

Results

Demographic Information

The average age of the participants was 21.39 years (SD = 2.95). Participants were Caucasian (81%), African American (10%), and Hispanic (7%). There were no differences between the diagnoses for race (χ^2 (1, N = 80) = .24, p = .62), relationship status (χ^2 (3, N = 80) = 4.01, p = .26), education level (χ^2 (4, N = 80) = 2.08, p = .72), income, (t(76) = −1.73, p = .09), or age (t(78) = .42, p = .68). Due to immediate checking procedures, there was no missing data in the present study—all participants completed all measures.

Testing Hypothesis 1—Following diagnosis, HPV/CIN will be associated with greater state shame and guilt than EBV/IM, but will not be associated with greater trait guilt-or shame-proneness.

As predicted, women diagnosed with HPV/CIN ($M = 2.94$, $SD = 0.97$) had substantially *higher* state shame scores than women diagnosed with EBV/IM ($M = 1.80$, $SD = 0.60$), $t(78) = 6.34$, $p < .001$, $d = 1.14$, 95% CI for Mean Difference: .48 to 1.40. Similarly, women with HPV/CIN ($M = 2.08$, $SD = 1.00$) had *higher* state guilt scores than women with EBV/IM ($M = 1.57$, $SD = .92$), $t(78) = 2.40$), $p = .02$, $d = 0.53$, 95% CI for Mean Difference: .08 to .94. These results were also consistent across subscales (all p's < .05, all d's > 0.2). Also as predicted, the two groups did not differ in either the negative evaluation or avoidance scales measuring shame-proneness ($t(78) = -1.26$, $p = .21$ and $t(78) = 0.02$, $p = .98$) or the total scale measuring guilt-proneness ($t(78) = .01$, $p = .99$) (all d's < 0.2).

Testing Hypothesis 2—Among women with HPV/CIN, but not EBV/IM, more accurate (i.e., higher) prevalence estimates will predict lower state shame following diagnosis and this relationship between knowledge and state shame will be stronger among women low in trait shame-proneness.

Hierarchical linear regression analyses tested the three-way interaction of trait shame-proneness, disease prevalence estimate, and HPV/CIN diagnosis on state shame following diagnosis. We predicted that trait shame-proneness would moderate the effects of disease prevalence estimates and diagnosis on state shame. The results of the interaction test can be found in Table 1 and are depicted in Fig. 1. As predicted, the three way interaction was significant such that (1) the two-way interaction between trait shame-proneness and prevalence estimate was significant only among women with HPV/CIN, and (2) within women with HPV/CIN, the association between *higher* prevalence estimates and *lower* state shame following diagnosis was significant only among women *low* in trait shame-proneness (simple slope of prevalence estimate on state shame among women with HPV/CIN with lower-than-average shame-proneness: $\beta = -.63$, $p = .005$)—whereas women *high* in trait shame-proneness who believed their diagnosis was prevalent were not buffered against state shame following HPV/CIN diagnosis (simple slope of prevalence estimate on state shame among women with HPV/CIN with higher-than-average shame-proneness: $\beta = .16$, $p = .48$). Examination of leverage values indicated that these findings were not driven by multivariate outliers.

Discussion

A diagnosis of HPV can lead to persistent experiences of distress, most notably shame and guilt (Kahn et al., 2007; Maissi et al., 2004; Tangney et al., 2007). The current study found that state shame and guilt—but not trait guilt-or shame-proneness—were higher in HPV/CIN than in EBV/IM following diagnosis. Further, accurate estimates of disease prevalence were not associated with state shame in women with EBV/IM, regardless of trait levels of shame-proneness. However, among women diagnosed with HPV/CIN, estimates that HPV/CIN was more prevalent were associated with decreased state shame following diagnosis—but only among women low in trait shame-proneness.

Interpretations and Clinical Implications

Given the present finding that HPV/CIN specifically predicts acute shame responses in a treatment-as-usual framework, and given the evidence that such shame may persist and increase risk for depression (Clarke et al., 1996), changes in clinical practice may be needed to prevent negative consequences among women diagnosed with HPV. The present study suggests that simply knowing that HPV is highly prevalent buffers against diagnosis-related shame for many women. Unfortunately, HPV-related prevalence knowledge remains low in the general population (Wong & Sam, 2010), and health care providers continue to give incomplete or unclear information to their patients regarding HPV (Cermak et al., 2010). It seems important for health care providers to clearly state that HPV is an extremely common diagnosis, affecting the majority of women in order to reduce shame responses and associated risk for depressive symptoms.

Among women with HPV who are high in shame-proneness, however, education regarding the prevalence of the diagnosis may not be effective (see Fig. 1). Women high in shame-proneness who have an accurate understanding of HPV prevalence rates appear to be unable to effectively use this knowledge of high prevalence to downregulate shame. One possibility is that these women's elevated levels of shame create a ceiling effect in which shame is chronically elevated. Another possibility is that shame-prone women suffer from cognitive interference due to the social threat of diagnosis and are therefore less able to make use of the knowledge that HPV is extremely prevalent to reduce shame (Cacioppo & Hawkley, 2009). Finally, these women may not benefit from their *own* awareness of the high prevalence of HPV because they realize that the general population is *unaware* of the high prevalence of HPV, and may therefore react to an HPV diagnosis as shameful despite its high prevalence. It may be advisable to refer these women for more comprehensive psychosocial interventions such as cognitive behavioral strategies in order to effectively downregulate shame and associated risk for psychological distress.

Strengths and Weaknesses of the Present Study

The present study has several strengths. Inclusion of a comparison group of women diagnosed with another immunologically similar disease (EBV/IM) allows the current study to demonstrate that shame is common in response to diagnosis with HPV/CIN specifically. This was the first study of its kind to use this type of clinical control condition. Additionally, group differences in negative affective responses to diagnosis were not due to individual differences in shame- and guilt-proneness, suggesting that there is something unique about the experience of being diagnosed with HPV/CIN that elicits this negative self-directed affect. Finally, some previous research has asked individuals to imagine that they were diagnosed with HPV, whereas the current study adds to the small body of literature using actual HPV/CIN patients to provide clearer support for the HPV-shame link.

The present study is not without limitations. First, the present study does not allow for specific conclusions regarding the specificity of shame responding to HPV/CIN diagnoses as compared to other sexually-transmitted infections. Rather, it allows only for a comparison between HPV/CIN and EBV/IM, a non-sexually-transmitted infection. Second, the roles of perceived disease severity and treatability, which may overlap substantially with perceptions

of disease prevalence, were not examined in the present study. It may be that beliefs regarding the treatability or severity of HPV/CIN play an important role in the link between perceptions of low disease prevalence and shame responding, and future studies should examine these possibilities. Third, due to the cross-sectional nature of the study, it is unknown whether immediate reactions to diagnosis would remain stable over time. Lastly, participants were not further prompted to give more information regarding diagnosis prevalence rates and did not receive additional information about actual diagnosis prevalence rates in the general or university population. Therefore, it is unknown whether the prevalence estimates that participants provided were merely a best guess or a truly accurate measure of participant's knowledge of diagnosis prevalence.

Future Considerations and Conclusions

Future work should further examine the predictors and consequences of shame responses to HPV diagnosis. One particularly interesting possibility is that prolonged experiences of shame and guilt could influence disease prognosis in women diagnosed with HPV, both through behavioral outcomes such as failing to follow through with subsequent cervical cancer screenings, as well as through detrimental stress-related neuroendocrine and immune responses. Shame has been shown to be associated with increases in cortisol activity (Gruenewald et al., 2004) and proinflammatory cytokine activity (Dickerson et al., 2004) under social threat. Moreover, negative self-evaluative emotions such as shame specifically cause declines in CD4+ T helper cells in HIV over the long term (Dickerson et al., 2004; Segerstrom et al., 1996). Therefore, persistent shame experiences in HPV patients may very well be associated with declines in key immune parameters vital to clearance of HPV cervical lesions (Coleman et al., 1994). This further highlights the importance of interventions that target shame.

In conclusion, this study demonstrates that, compared with EBV/IM, HPV/CIN diagnosis is related to greater acute shame and guilt. In addition, knowledge that HPV is very common protects against acute shame following diagnosis; however, this may only be true for women with low-to-average levels of trait shame. Therefore, further research is warranted to further clarify these processes and to identify effective methods for downregulating shame among women diagnosed with HPV.

Acknowledgments

This work was supported by grants from the National Institute of Mental Health (T32MH093315; K99MH109667).

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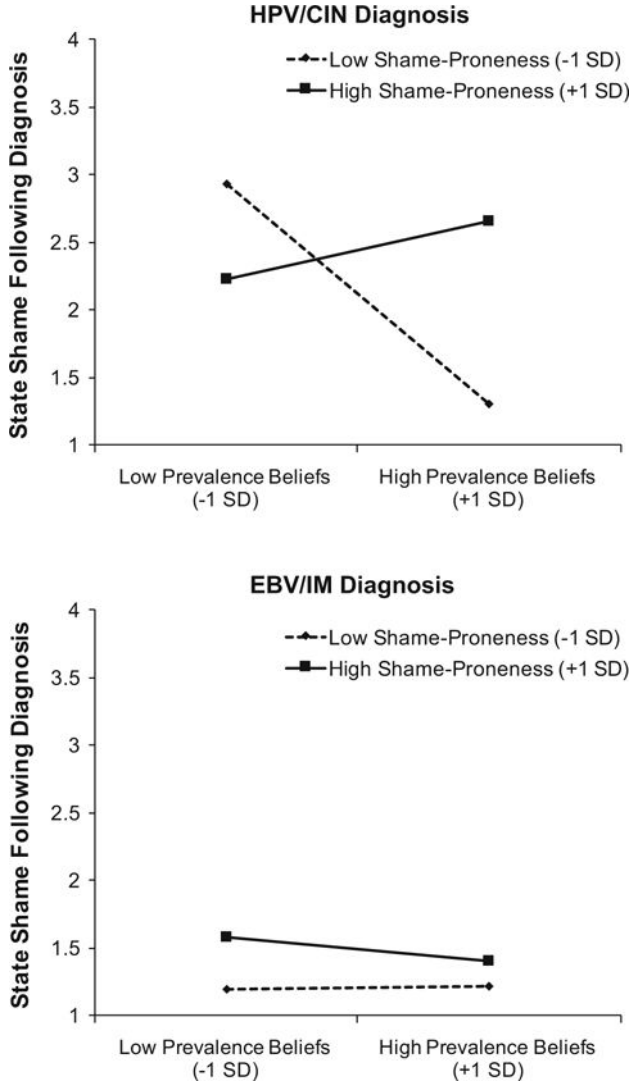

Fig. 1.

Depiction of the three-way interaction between trait shame-proneness, diagnosis prevalence beliefs, and HPV/CIN (vs. EBV/IM) diagnosis predicting state shame

Table 1

Hierarchical linear regression predicting state shame from the interaction of trait- shame- proneness, disease prevalence estimates, and HPV/CIN (vs. EBV/IM) diagnosis

Variable	β	p	Total R^2	$R^2\,\Delta$	p
Total State Shame (SSGS)					
Step 1			.34	.34	<.001
Trait shame proneness (SP)	.13	.41			
Disease prevalence estimate[a]	−.040	.80			
HPV/CIN diagnosis	.415	<.001			
Step 2			.42	.08	.04
SP × prevalence estimate	−.042	.82			
SP × diagnosis	.013	.93			
Prevalence estimate × diagnosis	−.174	.24			
Step 3			.52	.10	<.001
SP × prevalence estimate × diagnosis	.65	<.001			

[a]Participants estimated the prevalence of their diagnosis on a scale from 0 to 100% of the population. Estimates are presented as standardized betas